

IN THE CLAIMS:

Please add new Claims 18 and 19, cancel Claim 17 without prejudice or disclaimer of subject matter, and amend Claims 1 to 16 as shown below.

1. (Currently Amended) A radiation image pick-up device for performing image pick-up by using radiation, comprising:
 - a plurality of ~~input pixels~~; pixels;
 - ~~each having~~ a wavelength converter for converting incident radiation into ~~light~~; light;
 - conversion means for converting the ~~incident~~ radiation passing through said ~~and the light converted by the~~ wavelength converter and the light converted by said wavelength converter into a charge, said conversion means having a radiation detecting efficiency of at least 20%; ~~into charge~~;
 - storage means for storing the ~~converted charge~~; and charge;
 - reading read means for reading a signal corresponding to the charge stored in said the charge storage means; and
 - a plurality of output lines for outputting the charges read from said plurality ~~of the input pixels~~, said plurality of output lines being ~~which are connected to said~~ with the plurality of ~~input~~ pixels.

2. (Currently Amended) A radiation image pick-up device according to claim 1, further comprising first reset means for resetting the charge in said ~~the charge~~ storage means.

3. (Currently Amended) A radiation image pick-up device according to claim 2, wherein said ~~the~~ plurality of ~~input~~ pixels, said ~~the~~ output lines, and said ~~the~~ first reset means are respectively formed on an insulating substrate, said ~~the~~ first reset means includes a reset thin film transistor, and each of said plurality of ~~the input~~ pixels includes a read thin film transistor.

4. (Currently Amended) A radiation image pick-up device according to claim 3, wherein said ~~the~~ reset thin film transistor and said ~~the~~ read thin film transistor are made of non-single crystalline semiconductor.

5. (Currently Amended) A radiation image pick-up device according to claim 1, further comprising a transparent electrode that ~~which~~ is located between said ~~the~~ wavelength converter ~~conversion means~~ and said ~~the~~ charge conversion means and transmits the light converted by said ~~the~~ wavelength converter ~~conversion means~~.

6. (Currently Amended) A radiation image pick-up device according to claim 1, wherein ~~the~~ said ~~charge~~ conversion means has a semiconductor substrate for converting radiation into charge and a plurality of divided electrodes provided in correspondence with said ~~the~~ plurality of ~~input~~ pixels formed on an insulating substrate,

said ~~the~~ semiconductor substrate and the insulating substrate are laminated, and the plurality of divided electrodes and storage capacitors of ~~the~~ said plurality of pixels are electrically connected with each other.

7. (Currently Amended) A radiation image pick-up device according to claim 6, wherein said ~~the~~ semiconductor substrate is divided into plural regions.

8. (Currently Amended) A radiation image pick-up device according to claim 1, further comprising amplifiers for signal amplification in said plurality of ~~the~~ output lines.

9. (Currently Amended) A radiation image pick-up device according to claim 1, wherein ~~the~~ said charge conversion means is formed in a semiconductor substrate and has a pn junction portion.

10. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said ~~the~~ charge conversion means has an energy band gap ~~with a band gap~~ of at least 1 eV or larger.

11. (Currently Amended) A radiation image pick-up device according to claim 2, further comprising a second reset means for resetting said plurality of ~~the~~ output lines, said second reset means ~~which is~~ connected to said plurality of ~~with the~~ output lines.

12. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said ~~the~~ read means is composed of a thin film transistor ~~transistor~~, and ~~the thin film transistor is~~ made of non-single crystalline semiconductor.

13. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said ~~the~~ charge storage means and said ~~the~~ read means are formed on said ~~the~~ insulating substrate ~~in in a~~ the same layer structure having a lower electrode, a dielectric film, a high resistance semiconductor layer, a low resistance semiconductor layer, and an upper electrode.

14. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said ~~the~~ charge conversion means is made ~~of of~~ a semi-insulating semiconductor.

15. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said ~~the~~ wavelength converter ~~conversion means~~ includes a phosphor.

16. (Currently Amended) A radiation image pick-up device according to claim 15, further comprising a reflective layer on a radiation incident side of ~~the~~ said wavelength converter ~~conversion means~~.

17. (Cancelled)

18. (New) A radiation image pick-up device according to claim 1, wherein said conversion means detects the radiation passing through the wavelength converter at an efficiency of at least 20%.

19. (New) A method of performing image pick-up by using radiation, comprising the steps of:

converting incident radiation into light via a wavelength converter;

converting the radiation passing through the wavelength converter and the light converted by said wavelength converter into a charge, said converting step converting radiation at a radiation detecting efficiency of at least 20%;

storing the charge;

reading a signal corresponding to the charge stored in said charge storing step; and

outputting the charges read from a plurality of pixels via a plurality of output lines connected to the plurality of pixels.